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**GROUP 3600**

**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/787,363  
Filing Date: February 26, 2004  
Appellant(s): TAYLOR ET AL.

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Elizabeth Durham  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 3/19/07 appealing from the Office action  
mailed 6/6/06.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

This appeal involves claims 1, 3-17, 19-32.

Claims 2 and 18 are allowed.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

#### **WITHDRAWN REJECTIONS**

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner. The rejection of claims 2 and 18. These claims are allowable.

#### **(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

#### **(8) Evidence Relied Upon**

4825952	Mzik	5-1989
6511944	Taylor	1-2003
3954626	Greminger, Jr. et al.	5-1976

#### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 3, 4, 12, 16, 17, 19, 20, 28, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Mzik.

With respect to claims 1 and 17, Mzik discloses a method of treating/fracturing a subterranean formation comprising the steps of: providing a servicing fluid comprising carbon dioxide and a hydrocarbon blend, wherein the hydrocarbon blend comprises at

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least about 65% hydrocarbons having from six carbons (C.sub.6) to eleven carbons (C.sub.11) (see abstract and column 2 lines 34-38); and placing the servicing fluid into the subterranean formation (see column 1 lines 12-15).

With respect to claims 3 and 19, Mzik discloses a hydrocarbon blend where about 85% of the hydrocarbon blend comprises hydrocarbons having eight carbons (C.sub.8), hydrocarbons having nine carbons (C9), or a mixture of hydrocarbons having eight carbons (C.sub.8) and hydrocarbons having nine carbons (C9) (see abstract and column 2 lines 34-48).

With respect to claims 4 and 20, Mzik discloses a hydrocarbon blend has a Reid Vapor pressure below about 2 psi (The Reid vapor pressure would inherently be below about 2 psi as the composition of Mzik is substantially identical to the claimed composition).

With respect to claims 12 and 28, Mzik discloses a servicing fluid that further comprises particulates (see abstract).

With respect to claims 16 and 32, Mzik discloses a servicing fluid that comprises from about 30 volume % to about 80 volume % carbon dioxide by volume of hydrocarbon blend (see column 2 lines 34-38, wherein Mzik discloses 15-90% carbon dioxide by volume of hydrocarbon blend).

Claims 5, 6, 14, 15, 21, 22, 30, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mzik.

With respect to claims 5 and 21, Mzik teaches that a hydrocarbon component can be added in an amount of 5-85 %. Mzik further teaches that the hydrocarbon

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component can be a C<sub>5</sub>-C<sub>14</sub> constituent. Mzik does not specifically teach a hydrocarbon blend with less than 1% hydrocarbons having more than ten carbons. However, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Routine experimentation would have led one having ordinary skill in the art to form a hydrocarbon blend with less than 1% hydrocarbon having more than 10 carbons.

With respect to claims 6 and 22, Mzik teaches that a hydrocarbon component can be added in an amount of 5-85 %. Mzik further teaches that the hydrocarbon component can be a C<sub>5</sub>-C<sub>14</sub> constituent. Mzik does not specifically teach a hydrocarbon blend with less than 1% hydrocarbons having fewer than seven carbons. However, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Routine experimentation would have led one having ordinary skill in the art to form a hydrocarbon blend having less than 1% hydrocarbons having fewer than seven carbons by.

With respect to claims 14 and 30, Mzik teaches that a hydrocarbon component can be added in an amount of 5-85 %. Mzik further teaches that the hydrocarbon component can be a C<sub>5</sub>-C<sub>14</sub> constituent. Mzik does not specifically teach a hydrocarbon blend with less than 1% hydrocarbons having fewer than seven carbons about 5% hydrocarbons having seven carbons, about 44% hydrocarbons having eight carbons, about 43% hydrocarbons having nine carbons, about 8% hydrocarbons having ten

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carbons, and less than about 1% hydrocarbons having more than ten carbons.

However, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In *re* Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Routine experimentation would have led one having ordinary skill in the art to form a hydrocarbon blend comprising less than about 1% hydrocarbons having fewer than seven carbons (C.sub.7), about 5% hydrocarbons having seven carbons (C.sub.7); about 44% hydrocarbons having eight carbons (C.sub.8); about 43% hydrocarbons having nine carbons (C.sub.9); about 8% hydrocarbons having ten carbons (C.sub.10); and less than about 1% hydrocarbons having more than ten carbons (C.sub.10).

With respect to claims 15 and 31, Mzik teaches that a hydrocarbon component can be added in an amount of 5-85 %. Mzik further teaches that the hydrocarbon component can be a C<sub>5</sub>-C<sub>14</sub> constituent. Mzik does not specifically teach a hydrocarbon blend comprising substantially no hydrocarbons having more than eleven carbons. However, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In *re* Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Routine experimentation would have led one having ordinary skill in the art to form a hydrocarbon blend comprising substantially no hydrocarbons having more than eleven carbons.

Claims 7-10, 13, 23-26, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mzik in view of Taylor et al.

With respect to claims 7-10 and 23-26, Mzik does not teach a service fluid comprising a gelling agent present in an amount in the range of from about 0.1% to about 2.5% by weight of the hydrocarbon blend. Taylor teaches a hydrocarbon servicing fluid comprising a gelling agent of ferric iron or aluminum polyvalent metal salt of a phosphoric acid ester present in an amount in the range of from about 0.1% to about 2.5% by weight of the hydrocarbon blend in order to minimize volatile phosphorus in refinery distillation towers (see column 3 lines 56-59, column 4 lines 12-22, and column 6 lines 52-55). It would have been obvious to one having ordinary skill in the art to modify the servicing fluid of Mzik by adding a gelling agent of ferric iron polyvalent metal complex or aluminum polyvalent metal complex in the amount of 0.1% to 2.5% as taught by Taylor et al. in order to minimize volatile phosphorus in refinery distillation towers.

With respect to claims 13 and 29, Mzik does not teach a servicing fluid comprising a delayed gel breaker. However, Taylor et al. teaches adding a delayed gel breaker to a hydrocarbon servicing fluid in order to cause the hydrocarbon fracturing fluid to revert to a thin fluid that is produced back after fractures are formed in the subterranean formation (see column 5 lines 31-35). It would have been obvious to modify the servicing fluid of Mzik by adding a delayed gel breaker as taught by Taylor et al. in order to cause the hydrocarbon fracturing fluid to revert to a thin fluid that is produced back after fractures are formed in a subterranean formation.

Claims 11 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mzik in view of Greminger, Jr. et al.



Mzik does not teach a fracturing fluid which comprises a LPG. Greminger, Jr. et al. teaches a servicing fluid which comprises LPG in order to provide a mixture having a higher critical temperature than carbon dioxide alone (see column 3 lines 29-32). It would have been obvious to modify the invention of Mzik by adding a LPG fluid to the servicing/fracturing fluid as taught by Greminger, Jr. et al. in order to provide a mixture having a higher critical temperature than carbon dioxide alone.

#### **(10) Response to Argument**

I. The rejection under 35 USC 102(b): Mzik

Claims 1, 3, 4, 12, 16, 17, 19, 20, 28, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Mzik. Appellant argues that Mzik does not anticipate these claims because Mzik only discloses broad ranges, not the specific concentration ranges required by the claims. Appellant argues that Mzik does not disclose hydrocarbon blends with sufficient specificity to constitute anticipation under the statute. Appellant further argues that the declaration in response to the final office action shows unexpected results within the narrower range of C<sub>6</sub>-C<sub>11</sub> hydrocarbon concentrations recited in the claims.

Prior art which teaches a range within, overlapping, or touching the claimed range anticipates if the prior art range discloses the claimed range with sufficient specificity. In the instant case, the prior art range taught by Mzik completely encompasses the claimed range. MPEP 2131.03 states: If the claims are directed to a narrow range, the reference teaches a broad range, **and there is evidence of**

**unexpected results within the claimed narrow range**, depending on the other facts in the case, it may be reasonable to conclude that the narrow range is not disclosed with “sufficient specificity” to constitute an anticipation of the claims (emphasis added). Absent showing of unexpected results within the claimed range, the Examiner finds that Mzik discloses the claimed range with sufficient specificity.

Contrary to Appellants assertion, the declaration does not show unexpected results for the claimed range of C<sub>6</sub>-C<sub>11</sub> hydrocarbons. The declaration submitted in response to the final office action compared a kerosene surrogate composition which falls within the claimed range of Mzik (Mixture A) with a hydrocarbon blend of C<sub>7</sub>-C<sub>10</sub> hydrocarbons (Mixture B). The Examiner believes the declaration is insufficient for a number of reasons. First, to establish unexpected results over a claimed range, applicants should compare a sufficient number of tests both inside and outside the claimed range to show the criticality of the claimed range. *In re Hill*, 284 F.2d 955, 128 USPQ 197 (CCPA 1960). The declaration only compares one example given in the prior art reference Mzik. On column 2 lines 22-33, Mzik discloses specific examples that can be used that fall within the disclosed range of C<sub>5</sub>-C<sub>14</sub> which include light and heavy naphtha, kerosene, light gas oil, etc. The Appellant has only chosen to compare a kerosene with Mixture B. Appellant has not shown unexpected results over the other examples given in Mzik and it is unclear whether there are unexpected results for these other examples disclosed in the prior art reference which overlap the Appellant's claimed range. Second, by only giving data for a blend comprising C<sub>7</sub>-C<sub>10</sub> Appellant has failed to show unexpected results for Appellants claimed range of C<sub>6</sub>-C<sub>11</sub> hydrocarbons.

Thus, the Examiner finds the declaration is deficient and does not show unexpected results for Appellants claimed range. Because the declaration is deficient, it is reasonable to conclude that Mzik discloses the claimed range with "sufficient specificity," and that the 102(b) rejection of the claims is appropriate.

With respect to claims 2, 3, 18, and 19 the Appellant argues that Mzik does not disclose hydrocarbon blends either (1) comprising at least about 65% C7-C10 hydrocarbons or (2) wherein about 85% of the hydrocarbon blend comprises C8 hydrocarbon, C9 hydrocarbons, or a mixture of C8 and C9 hydrocarbons with sufficient specificity to constitute an anticipation under the statute. As noted above, the declaration does not show unexpected results over Mzik with respect to claims 3 and 19 and thus it is reasonable to conclude that Mzik discloses the claimed range with "sufficient specificity," and that the 102(b) rejection of the claims is appropriate. With respect to claims 2 and 18, the claims have been allowed.

## II. The 103 rejection of claims 5, 6, 14, 15, 21, 22, 30, and 31:Mzik

Claims 5, 6, 14, 15, 21, 22, 30, and 31 are rejected under 35 U.S.C. 103(a) as being obvious over Mzik.

Appellant first argues that Mzik does not teach the concentrations of hydrocarbons required in claims 1 and 17 from which these claims depend. That argument has been addressed above.

Appellant next argues that Mzik fails to recognize the concentrations of hydrocarbons as a "result-effective variable." A particular parameter must first be

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recognized as a result-effective variable, i.e. a variable which achieves a recognized result, before the determination of the optimum or workable ranges of the variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Mzik recognizes that the concentrations of hydrocarbons are a result-effective variable. Mzik discloses that density and viscosity are important characteristics of a fracturing fluid (see column 1 lines 37-38) and that several concepts were considered for thickening liquid carbon dioxide (see column 1 lines 49-50). Mzik further discloses that the viscosity of petroleum is increased more rapidly with decreasing temperature than any other suitable polymeric solution and that petroleum could be useful in the fracturing process if a hydrocarbon mixture could be found having required properties and which is miscible with liquid carbon dioxide (see column 1 line 65 to column 2 line 3). Mzik further discloses that the hydrocarbon mixture is capable of providing a higher viscosity and ensuring a greater fracture width and simplifies cleanup (see column 2 lines 4-10). Thus, the hydrocarbon blend added affects the amount of viscosity, the width of the fracture, and the ease of cleanup. Therefore, the hydrocarbon blend is a result-effective variable.

The Appellant next argues that Mzik teaches away from claims 15 and 31. Appellant also argues that in order for this requirement to be an obvious optimization of the hydrocarbon blends described in Mzik, the prior art must suggest the desirability of a hydrocarbon blend comprise substantially no hydrocarbons larger than C11. However, as noted above, Mzik teaches that the type of hydrocarbon blend added is a result-effective variable. Thus, depending on the desired viscosity, width of fracture and ease

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of cleanup, routine experimentation would have led one having ordinary skill in the art to form a hydrocarbon blend comprising substantially no hydrocarbons having more than eleven carbons.

The Appellant further argues that unexpected properties of Appellants' claimed hydrocarbon blends rebut the assertion that those blends would be obvious. As noted above, the Examiner finds that Appellant has not shown unexpected results for Appellants claimed hydrocarbon blends.

III. The 103 rejection of claims 7-10, 13, 23-26, and 29: Mzik in view of Taylor

Claims 7-10, 13, 23-26, and 29 are rejected under 35 U.S.C. 103(a) as being obvious over Mzik in view of Taylor.

The Appellant argues that since claims 7-10, 13, 23-26 and 29 depend, directly or indirectly from claim 1 or 17, these dependent claims include the limitations of claims 1 and 17 that neither Mzik nor Taylor teaches. As noted above, Mzik does teach claims 1 and 17, and thus the rejection of claims 7-10, 13, 23-26 and 29 are obvious over Mzik in view of Taylor.

IV. The 103 rejection of claims 11 and 27: Mzik in view of Greminger, Jr.

Claims 11 and 27 are rejected under 35 U.S.C. 103(a) as being obvious over Mzik in view of Greminger, Jr.

The Appellant argues that because claims 11 and 27 depend, directly or indirectly from claim 1 or 17, these dependent claims include the limitations of claims 1

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and 17 that neither Mzik nor Greminger, Jr. teaches. As noted above, Mzik does teach claims 1 and 17, and thus the rejection of claims 11 and 27 are obvious over Mzik in view of Greminger, Jr.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,


nac

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